TWO PREHISTORIC BURIALS FROM QASR KHARANEH

by
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Mujahed Muheisen's fortunate discovery of two Kebaran(?) Period burials at Qasr Kharaneh is indeed exciting. It is not often that we have an opportunity to examine the physical remains of prehistoric people in this area, and the vague period of the beginning of the shift to food production is one of the most important for skeletal studies. Before looking at the skeletons it seems appropriate to look at the problem they may help to resolve. It has been suggested by historians and anthropologists (McNeill, 1976, p. 5-68; Harris, 1977, p. 11-43) and demonstrated by osteologists (Angel, 1975, p. 169-190) that although plant and animal domestication eventually provided a food base sufficient to support a much larger population, it nevertheless represented a decline in overall health for the generations of people who made the shift. This decline was caused by exposure to new diseases as well as by dietary deprivation. The obvious health advantages of a meaty diet and the less broadly applicable but intriguing ethnographic evidence of present day hunters and gatherers (Lee, 1968; Harlan, 1975, p. 3-32) suggest that farming began with a series of ecological stop-gap measures and was not viewed as an opportunity at all. Although the yields of the early domesticates may not have been significantly smaller (Zohary, p. 58 in Ucko and Dimbleby, 1969), the investment of time and labor as well as the necessary social alterations for cultivation and husbandry must make us skeptical of models that view the Neolithic Revolution as a planned, or even desirable, event from the stand-point of those prehistoric people. Instead it is probably more accurate to say that man was cornered into that new relationship and forced to exploit a less desirable food resource. Changes of climate may have been a factor, but it was more probably as a result of his own wasteful techniques that man altered the ecological balance between himself and the larger herbivorous protein banks he had hunted. His relationships with potentially domesticatable plants and animals had long been part of his resource inventory (Harris, 1969, p. 3-15, in Ucko and Dimbleby, 1969). Far from being forced to cast about for plants and techniques, he simply shifted his predominant reliance toward a resource that had previously been only an occasional food. The idea of deliberate planting need not be viewed as a miraculous or even difficult mental development. Nor should it be ruled out that man may have begun to plant long before he ceased to hunt. That is a brief statement of the problems.

Whatever the causes and the sequences of events of the Neolithic Revolution were, its consequences can be charted rather accurately through skeletal studies. In brief, those consequences were an abrupt and serious decline in dental health, probably due to softer foods and an increase in carbohydrate intake, as well as a decline in the level of health generally. We can trace this pattern insofar as it is reflected by stature, morbidity rates, and longevity.[1] The Kebaran sites in Palestine (16,000 - 10,000 B.C.) show a move away from larger game and toward a wider range of foods (Mellaart, 1975, p. 18-28). Their diet continued to contain significant amounts of animal protein and calcium however, and this would have been beneficial. The dis-

1. This is clearly observable in Neolithic vs. Mesolithic populations in Iberia, as current investigations are showing (Rolston, in press, Geological Services, Lisbon, Portugal). It should be noted that Angel (1974, p. 382-391) has shown that dental health and overall health are not necessarily correlated.

advantages of a predominantly cereal diet, even if only from gathered wild strains, are not to be expected among them beyond a possible increase in the frequency of dental caries. The real health decline of the Mesolithic and early Neolithic (Angel, 1974) was still far in the future.

There is a wealth of information to be retrieved from bones (Angel, 1969; 1975, p. 107-190; Brothwell, 1965; Edynak, p. 408-432 and Saul, p. 372-382, in Giles and Friedlaender; Steinbock, 1976; Ubelaker, 1978). In fact, we stand to gain the sort of data we have always claimed are important, contributing not to a mere study of material culture but to a dynamic diachronic profile of a people living in an environment and competing with other organisms sharing it. We can also trace the affinities of people on the move with increasing precision (Berry and Berry, 1967, p. 361-379; Howells, 1966, p. 531-540; 1969, p. 311-314; 1973, p. 159-176; 1973 b), beginning at last to definitively answer through bones the questions which have been fruitlessly asked of artifacts. "Who are these people? Where did they come from? How did they interact socially (i.e. genetically)? How did their environment and lifestyle affect them?" But we must have large skeletal samples of populations from all periods in order to get a clear look at their traits, both genetic and aquired. This will bring us much closer to an understanding of these long dead people.

What follows is a short report of the fragmentary remains of only two prehistoric individuals. It is expected that they are only the first of many to be recovered and studied in Jordan. Ordinarily, some of the metric detail presented here would be found only in the raw data sheets, but the importance of the population from which they came prompts more full publication of detail for the benefit of other researchers. Carbon 14 dates are not available at the time of this writing, but will be obtained during the forthcoming year.

My thanks are due to Mr. Mujahed Muheisen of the Jordanian Department of Antiquities for making this material available to me.

The Remains

Two fragmentary skeletons are represented in the remains from Qasr Kharaneh. The burials appear to have been primary and extended with the bodies placed on their backs. The hands were along their sides. The compass orientation of the skull of burial no. 2 was northeast. The antlers of a gazelle were found to have been placed on either side of the head of the person in burial no.2. Such behavior is clearly ritual and symbolic, and may indicate personal status as well as an item of subsistence. Beyond that we should not guess until we have had an opportunity to examine other contemporary burials. It should be noted, however, that this person's facial appearance may have been unusal and that his health was decidedly poor (see below).

BURIAL NUMBER 1

Sex: Male? Criteria: Vertical diameter of the humeral head.
Age: Young Adult Criteria: Residential signs of epiphyseal closure.

Cranial material: Nothing recovered

Mandibular material: A fragment of left portion of the mandible with the ascending ramus was recovered. It is not a robust specimen.

Length:	61.5
Direct Ramus Ht:	67.5
Minimum Ramus Br:	36.5
Body Ht. (M1 & M2):	?
Body thickness:	16
Goneal eversion:	+

Dental pathology:

Left M1 & M2 were lost shortly before death. M3 was lost just before death or post mortem. The cancellous bone is not repaired. There is severe (+ + +) alveolar resorption and M3 is maloccluded lignually. There are signs of disturbance in the left tempero-mandibular joint. The infection was active at the time of death.

Scapula (right):
Glenoid height: 41 Glenoid breath: 29.5

Humerus:

	Left	*Right*
Maximum length:	305	308.5
Vertical head diameter:	46.5	45
Maximum midshaft:	22.5	19
Minimum midshaft:	18	16
Distal epiphyses breath:	59	59
Robusticity index	20.4	17.9
Stature estimate	164.5 cm.	
Supra-condyloid foramen:	none	none

Pathology and Remarks:

There is periostitis on the left humeral diaphysis at the level of the deltoid tuberosity. The right bone is more gracile than the left and the left deltoid area is very strongly developed, suggesting left handedness. There does not appear to be any disuse atrophy on the right, so an injury to that limb or its neural controls can be ruled out.

Radius:

	Left	*Right*
Maximum length:	242.5	243.5
Bowing:	+	+
Interosseous crest:	+ +	+ +
Stature estimate:	171 cm.	

Ulna:

Only the distal end of the right ulna has been recovered. It shows signs of a healed spiral fracture.

Femur (Left only):

Stature increment 1-2:	67
2-3:	207
3-4:	107
Stature estimate:	165 cm.
Maximum head diameter:	43 .5
Platymeric index:	70.7 (very flat)
Shaft circumference:	84
Bowing:	+
Anterior neck erosion:	none
3rd trochanter:	trace

Remarks and Summary

Burial number one is the remains of an adult male who suffered from an infection which affected his teeth and jaw rather severely. He was rather short by epipaleolithic standards (Angel, 1975), with an estimated stature of about 167 cm.

BURIAL NUMBER 2

Number 2 is a male, the criteria being the sciatic notch, discriminant analysis of the mandible (Giles, 1970), the mastoids, brow, and general robusticity.[2] The pubic sympysis was not preserved, but an estimate of his biological age, based upon endocranial suture closure, places him between 35 and 45 years. Brothwell's tooth wear formula (Brothwell, 1965, figure 30) and his vertebral arthritis suggest an age above forty.[3]

Frontal:

The brow is divided and of medium (+) size. There is complete metopism, a trace of frontal grooves, slight post-orbital constriction, small frontal bosses, and small median crest.

Prietals:

There is no saggital elevation or parietal bossing. Pterion type is K on the right and unknown on the left. The parietal foramen is small.

Occipital:

Slight lamboid flattening and a mod-

2. The discriminant function used was that divised for modern white populations. His score was 308.4, well above the sectioning point of 287.43. It is not suggested that Giles formulae are always useful for prehistoric populations. In a function weighted for his own group he may have scored higher.

3. His arthritis may not be useful as even a general age indicator; see below, Pathology.

Craninal and Mandibular Metric Data:

The skull is broken, but much of the vault has been preserved. All measurements except overall stature estimates are in millimeters.

Cranium:

Glabello-occipital:	180	Maximum frontal br:	130
Nasion-occipital:	175.5	Minimum frontal br:	108
Basion-bregma:	115?	Bi-mastoid:	159
Auricular-bregma:	102	Bi-auricular:	143
Forehead height (bregma):	73.5	Left parietal thick:	6.5
Auricular vertex:	110	Mastoid ht:	28
Nasion-bregma chord:	109	Zygoma thickness:	6.5
Bregma-lambda chord:	117	Bi-orbital breadth:	105
Frontal arc:	131	Inter-orbital br:	30
Parietal arc:	136	Orbit height:	30.5
Transverse arc:	330?	Orbit breadth:	36.5
Vault breadth:	150.5	Upper nasalia br:	14.5

Mandible:

Chin Height:	32	Body height (Ml):	27.5
Bicondylar:	134?	Minimum ramus br:	35
Bigonial:	113.5	Gonion-symphysis	80
Bimental:	46	Condyle-gonion	61?
Corpus thickness:	15.5		

Indices:

Cranial:	83.61	(broad/round)
Mean Porio-height:	61.72	(low)
Frontal-partietal:	71.7	(broad)
Cranial Module:	148.5?	
Orbital:	83.5	(medium)

erate (+) cerebeller bulge are in evidence.

Sutures:

Serration is 5/10 mm Coronal, 11/10 mm Saggital, 8/10 mm Lambdoid. Closure is nearly complete in the coronal suture, complete in the saggital with some lapsed union, and nearly complete (+ + +) in the lambdoid. The other sutures are not preserved.

Misc. Cranial:

The auditory meatus is ellipsoid. The orbits are square with no infra-orbital suture in evidence. The nose root is wide with a low bridge.

Mandible:

Chin form is bilateral and slightly projecting. Genial tubercles are not in evidence. Gonial eversion is strong (+ +), and there is no mandibular torus.

Molar teeth:

Size	M1 Ht: ? L: 10.5 Br: 11.5	M2 Ht: ? L: 10.5 Br: 10.5	M3 Ht: ? L: 11.5 Br: 10.5
Wear	M1 3	M2 5	M3 4 (after Brothwell, 1965)
Cusp	M1 ?	M2 4	M3 4

The traits indicative of epigenetic variation (Berry and Berry, 1967, p. 361-379)

were recorded insofar as the fragmentary nature of the material would permit.[4]

Postcranial, Metric and Non-Metric:

Clavicle (Left only): maximum length 145 mm.
Scapula (Right only):

Morphological breadth:	132
Glenoid height:	38
Glenoid breadth:	27

The notch on the superior border is quite pronounced and acromion is of an intermediate shape. The glenoid is comma shaped with slight lipping.

Humerus (Left only):

Maximum length:	315
Vertical head diameter:	44
Robusticity Index:	19.84
Stature estimate:	167 cm.
Olecranon perforation:	none

The relative degree of deltoid development suggests that this person was right handed.

Inominates:

	Left	*Right*
Iliac breadth:	150	149
Ischial length:	?	72
Bi-iliac breadth:	250	
Pelvic brim M.L.:	112	

Sacrum:

Height: 119, Breadth: 103, Index: 86.5

The sacral curvature is moderate (+) and begins at the 3rd sacral foramen. The posterior notch is equal in length to 25% of the overall sacral height. The index is very low, even lower than those published for African populations by Wilder (1920, p. 118). The bone was exceedingly narrow in relationship to its breadth.

Femur:

	Left	*Right*
Maximum head diameter:	46	47
Platymeric index:	69.5	
Stature increments 1-2:	71	?
2-3:	235	?

There is no anterior neck erosion or visible squatting facets. Bowing of the shaft is present (+) but not pronounced.

Tibia:

	Left	*Right*
Maximum length:	67	72
Medical Condyle-Maleolus:	356	365
Platycnemic Index:	55.5	62.5
Upper epiphysis breadth:	77.5	82
Squatting facets, distal:	slight	slight
Stature estimate:	169 cm.	

The left bone is somewhat shorter than the right. Though there is no sign of atrophy in either bone, this may have been due to a pathological condition (see below, Pathology).

Pathology:

Burial number 2 seems to have been an unfortunate individual in a number of respects. His skull displays strongly developed (+ +) supra-mastoid crests and strong (+ +) gonial eversion. This was due to a rather severe underbite which probably made it difficult for him to chew. Although the upper face was not recovered, the mandibular incisors and canines are worn well down (+ +) like grinders in a sharp buccal

4. Parties interested in details of these epigenetic observations should contact the author through the Jordanian Department of Antiquities.

to lingual plane. He apparently compensated for a lack of normal occlusion by forcing his jaw back and forth as well as our laterally and up to meet his maxillary teeth. The only fragment of maxilla recovered contains left M2 and M3. Their usual occlusion was with left mandibular M3, which is pushed over 30 degrees off vertical in a lingual direction. Eating must have been a chore. There is moderate to severe (+ +) alveolar resorption and slight tartar but no caries despite severe wear and pulp exposure throughout the dental arcade.

Postcranially he exhibits varying degrees of arthritic degeneration in every recovered fibrous and synovial joint. There is eburnation, especially medially, and the knees and some rarification on the heads of the femora and humeiri, as well as the distal humerus. Vertebral osteophytosis is particularly severe (+ + + +) in the lumbar region and is at least present all along the vertebral column (thoracic + +, cervical +). This vertebral involvement is typically that of osteophytosis, though there is little apparent narrowing of the intervertebral spaces. There is, however, lipping involvement of the apophyseal joints on the vertebral processes which probably should not be classified along with the osteophytosis (Putschar, 1958, p. 439-444; Steinbock, 1976, p. 287-294). The involvement of all of the joints rather symmetrically suggests a not very advanced degree of rheumatoid arthritis. His relative youth supports this, as he would have first shown symptoms of the disease years earlier and rhematoid arthritis often attacks the young. The interphalangeal joints are as much affected as the metacarpophylangeal, however, which holds against a diagnosis of rheumatoid arthritis. His worst area of involvement, by far, is the vertebral column. This material will be submitted to the headquarters of the Paleopathology Association in Detroit, Michigan, for a collective judgement. If it does prove to be rheumatoid it will be oldest known case.

Several of the ribs are swollen in such a manner as to suggest an internal cavity rather than a badly healed fracture. Both clavicles show signs of lesions on their inferior medial surfaces which were active at death. The greater and lesser trochanter show disturbances bilaterally, though especially on the left, and the right acetabulum contains an area in which a lesion was apparently active at the point of contact with the fovea capitis. Both femora are thickened in the sub-trochanteral area, antero-medially, as a result of abnormal use of the iliacus muscle in walking on the insides of the feet. This apparently aggrevated the arthritis on the medial condyles of the tibiae. The cause of such a gait appears to have been an infection in the lower leg area. The tibia show signs of periosteal disturbance just under the proximal epiphyses as well as periostitis along the medial aspects of both shafts. In addition, the left tibia is 9 mm shorter than the right and has a spur of bone on its medial diaphysis. This does not appear to be neoplastic and may have been the result of a puncture injury. The fibula shows signs of a healed fracture on the distal diaphysis. The right fibula has suppurative osteomyelitis along the shaft. Cloaca are in evidence. There is swelling of the distal metaphysis of the left fibula.

Summary:

The person represented by burial number 2 was suffering from several conditions, the most serious of them apparently having been an acute and wide spread bone infection ongoing at the time of death.

Burial number, did have severe dental problems just before death, but these were not caused by caries or abscesses. It seems unlikely that such conditions could cause the sudden loss of many teeth. Thus far then, a model of superior dental health and relatively high stature in the Epi-Paleolithic is neither disproved nor upheld by the individuals from Kharaneh.

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BIBLIOGRAPHY

Angel, J. Lawrence 1974 — The cultural ecology of dental versus general health, Bevolkerungsbiologie, Gustav, Fischer, Stuttgart.

Angel J. Lawrence 1975 — Paleoecology, paleodemography and health in: Steven Polgar (ed), *Population, Ecology, and Social Evolution.*

Bass, William M. 1971 — *Human Osteology,* Special publication of the Missouri Archaeological Society, University of Missouri, Columbia.

Berry, A. Caroline and R.J. Berry 1967 — Epigenetic variation in the human cranium, Journal of Anatomy, 101, p. 361-379.

Bronson, Bennet 1977 — The earliest farming: demography as cause and consequence, in Reed, Charles (ed), *Orgins of Agriculture,* Mounton, The Hague.

Brothwell, Don R. 1965 — *Digging Up Bones,* British Museum, London.

Copeland, L. and F. Hours 1971 — A microlithic flint study of the Wadi Rum, Jordan, and a review of the Epi-Paleolithic of Northern Arabia, in: Proceedings of the Seminar for Arabian Studies, 1970, p. 7-21, London.

Edynak, Gloria Jean 1976 — Lifestyles from skeletal material: A medieval Yugoslav example, in: Giles and Friedlaender, *The Measure of Man,* Peabody Museum Press, Cambridge.

Garrod, Dorothy 1932 — A new Mesolithic flint industry: The Natufian of Palestine, Proceedings of the Prehistoric Society. Vol. 8.

Garrod, Dorothy 1932 — Notes sur le Paleolithique Superieur du Moyen Orient, Bulletin Soc. Prehist. Francaise, Vol. 54:p. 439-446.

Giles, Eugene 1970 — Discriminant function sexing of the human skeleton, in: *Personal Identification in Mass Disasters,* T.D. Stewart (ed.). N.M.N.H. Smithsonian Institution, Washington, D.C.

Harris, David R. 1969 — Agricultural systems, ecosystems, and the origins of agriculture, in: Ucko and Dimpleby (eds.) *The Domestication and Exploitation of Plants and Animals,* Aldine, New York.

Harris, Marvin 1977 — *Cannibals and Kings,* Vintage/Random House, New York.

Harlan, Jack R. 1975 — *Crops and Man,* The American Society of Agronomy and the Crop Society of America, Inc., Madison, Wisconsin.

Henry, D.O. and F.A. Hasson, M. Jones, and K.C. Henry 1981 — An investigation of the prehistory and Paleonvironment of southern Jordan, 1979 season, A.D.A.J., 1981, p. 113-145.

Howells, William 1966 — Population distances; biological, linguistic, geographical, and environmental, Current Anthropology, 7, p. 531-540.

Howells, William 1969 — The use of multivariate techniques in the study of skeletal populations, American Journal of Physical Anthropology, 31, p. 311-314.

Howells, William 1973 a — Measures of population distances, in: Crawford and Workman (eds.), *Methods and Theories of Anthropological Genetics,* University of New Mexico Press, Albuquerque.

Howells, William 1973 b — Cranial Variation in Man; A Study by Multivariate Analysis of Patterns of Difference Among Recent Human Populations, Peabody Museum Papaers, Vol. 67.

Kenyon, Kathleen 1957 — *Digging Up Jericho,* Praeger, New York.

Lee, R.B. 1968 — What hunters do for a living, or how to make out on scare resources, in: Lee and DeVore, Man the Hunter, 1968, Aldine, Chicago.

McNeill, William H. 1976 — *Plagues and People,* Anchor/Doubleday, Garden City, New York.

Mellaart, James 1975 — *The Neolithic of the Near East,* Thames and Hudson, London.

Putschar, Walter G.J. 1958 — General pathology of the musculo-skeletal system, in: F. Buchner (ed.), 1960, *Handbuch der Allgemeinen Pathologie,* 2nd ed, Springer-Verlag, Berlin.

Reed, Charles A. (ed.) 1977 — *Origins of Agriculture,* Mouton, The Hague.

Saul, Frank P. 1976 — Osteobiography: Life history recorded in bone, in: Giles and Friedleaender, *The Measures of Man,* Peabody Museum Papers, Cambridge.

Steinbock, Ted 1976 *Paleopathological Diagnosis and Interpretation,* Charles C. Thomas Co., Springfield, Illinois.

Ubelaker, Douglas 1978 *Human Skeletal Remains,* Manuals of Archaeology no. 2, Taraxacum, Washington, D.C.

Ucko, Peter J. and G.W. Dimbleby 1969 *The Domestic and Exploitation of Plants and Animals,* Aldine, Chicago.

Wilder, Harrison H. 1920 *Laboratory Manual of Anthropometry,* P. Blakistons and Sons, Philadelphia.